WASHINGTON DEPARTMENT OF ECOLOGY

ENVIRONMENTAL ASSESSMENT PROGRAM

FRESHWATER MONITORING UNIT

STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 25E060

STATION NAME: Abernathy Creek

WATER YEAR: 2009

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Introduction

Watershed Description

Abernathy Creek is a right bank tributary to the Columbia River located approximately 9 miles west of Longview, Washington. Historically the stream supported runs of coho and chinook salmon and steelhead and cutthroat trout. Land use is primarily commercial forestry with state and private holdings. Flow basalt with interbedded sandstone defines the underlying geology. Precipitation varies with elevation but typically ranges between 60 and 70 inches annually. Hydrology is almost entirely rainfall driven.

Gage Location

The gage is on the right bank near the downstream side of the Slide Creek road bridge.

Table 1.

Drainage Area (square miles)	20.3
Latitude (degrees, minutes, seconds)	46 12 20.7 north
Longitude (degrees, minutes, seconds)	123 09 14.0 west

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	72
Median Annual Discharge (cfs)	58
Maximum Daily Mean Discharge (cfs)	466
Minimum Daily Mean Discharge (cfs)	7.1
Maximum Instantaneous Discharge (cfs)	607
Minimum Instantaneous Discharge (cfs)	5.6
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	157
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	8.6
Percent of Time Discharge is Greater Than Range of Ratings	3.0
Percent of Time Discharge is Less Than Range of Ratings	0.0

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

A large storm event in January of 2009 damaged station infrastructure. The staff gage was lost and the primary gage index was replaced with a laser level. The storm event in January accounted for 9 of the 11 missing days. The discharge statistics noted above are less than actual values because the missing data occurred during periods of elevated discharge.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	4.9
Weighted Rating Error (% of discharge)	9.6
Total Potential Error (% of discharge)	14.5

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	5	6	7	
Period of Ratings	10/01-01/13	01/13-09/29	09/29-09/30	
Range of Ratings (cfs)	4.6-665	4.8-490	5.9-590	
No. of Defining Measurements	8	9	7	
Rating Error (%)	10.7	9.6	8.3	

Rating Table No.				
Period of Ratings				
Range of Ratings (cfs)				
No. of Defining Measurements				
Rating Error (%)				

Narrative

Rating 5 covered the beginning of Water Year (WY) 2009. A very large and long storm event in January of 2009 resulted in channel filling and the rating shifted to Table 6. This table persisted until almost the end of the Water Year. Minor scouring of the channel then shifted the rating from Table 6 to 7. Table 7 covered the last two days of WY 2009.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	4.29
Maximum Recorded Stage (feet)	12.69
Range of Recorded Stage (feet)	8.40
Number of Un-Reported Days	0
Number of Days Qualified as Estimates	0
Number of Days Qualified as Unreliable Estimates	11

Narrative

Infrastructure improvements made prior to the beginning of WY 2009 dramatically reduced the number of data gaps that had been plaguing the station. Consolidation, augmentation, and stabilization of the power supply improved data quality and continuity. The maximum stage was recorded on January 7, 2009.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	none
Range of Modeled Stage (feet)	
Range of Modeled Discharge (cfs)	
Valid Period for Model	
Model Confidence	

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
Station	6/24/2009

Activities Completed

Laser level infrastructure installed in June 2009.